

I claim:

- 1 1. A method of adapting audio according to a listener's auditory capability,
2 comprising the steps of:
3 accessing a personal audio profile of the listener, the audio profile
4 describing the auditory capability of the listener in relation to a plurality of
5 audible frequencies;
6 accessing a digital representation of audible sound; and
7 creating an adapted representation of audible sound by modifying the
8 digital representation based on the audio profile to assist the listener in
9 perceiving the audible sound.
1
1 2. The method of claim 1, wherein the step of creating an adapted representation
2 comprises the steps of:
3 converting the representation to a different data format than that in which
4 it was accessed, creating a converted representation;
5 transforming the converted representation to a frequency domain vector
6 using a Fourier transform;
7 scaling the frequency domain vector according to the audio profile,
8 creating an adapted frequency domain vector;
9 transforming the adapted frequency domain vector to an adapted time
10 domain sample using an inverse Fourier transform; and
11 converting the adapted time domain sample to a format for presentation.

1

1 3. The method of claim 2, wherein the scaling step further comprises one or
2 more of the steps of frequency filtering, frequency shifting, frequency masking
3 compensation, and adaptive signal processing.

1

1 4. The method of claim 1, further comprising the step of:
2 initiating a transmission of the adapted representation to the listener.

1

1 5. The method of claim 4 wherein the representation is accessed and the adapted
2 representation is transmitted through a network of computers.

1

1 6. The method of claim 1 wherein the audio profile is stored in a database.

1

1 7. The method of claim 6 wherein the audio profile is provided to the database
2 by an audio test agent through a network of computers.

1

1 8. The method of claim 1 wherein the adapted representation includes audio
2 information representing a range of frequencies from 20 Hz to 20 kHz.

1

1

1 9. A system for assisting a hearing deficient user, comprising:
2 a database for storage of an audio profile of the user, the audio profile
3 describing the auditory capability of the user in relation to a plurality of audible
4 frequencies;
5 an adaptation engine coupled to the database for receiving an audio
6 representation selected by the user and modifying the audio representation
7 according to the audio profile wherein the modifying assists the user in hearing
8 the audio representation.

1
1 10. The system of claim 9 wherein the audio representation is received over a
2 packet-switched network of computers.

1
1 11. The system of claim 9 wherein the adaptation engine further comprises:
2 a converter configured to convert the audio representation from its
3 original format into a base format, creating a converted audio representation;
4 a transformation module coupled to the converter configured to transform
5 the converted audio representation into a frequency representation;
6 a scaling module coupled to the transformation module configured to
7 scale the frequency representation based on the audio profile, creating a scaled
8 representation.

1

1 12. The system of claim 11 wherein the scaled representation includes audio
2 information representing a range of frequencies from 20 Hz to 20 kHz.

1

1 13. The system of claim 11 wherein the scaling module is further configured to
2 scale the frequency representation by one or more of frequency filtering,
3 frequency shifting, frequency masking compensation, and adaptive signal
4 processing.

1

1 14. The system of claim 11 wherein the transformation module is further
2 configured to transform the scaled representation into the base format creating a
3 scaled converted audio representation and the converter is configured to convert
4 the scaled converted audio representation into a presentation format creating a
5 scaled audio representation for transmission to the user.

1

1 15. The system of claim 14 wherein the scaled audio representation is
2 transmitted over a packet-switched network of computers.

1

1 16. The system of claim 14 wherein the scaled audio representation can be
2 presented by a computer for listening by the user.

1

1 17. The system of claim 9 wherein the adaptation engine is located on a user
2 computer.

1 18. The system of claim 9 wherein the adaptation engine is located on a
2 computer coupled to a network, the computer being remote from the user.

1 19. The system of claim 9 wherein the audio profile is generated by and
2 provided to the database by an audio testing agent through a computer network.

1

[illegible]

1 20. A network audio adaptation server comprising:
2 a memory configured to store a personal audio profile of a listener, the
3 audio profile describing the auditory capability of the user in relation to a
4 plurality of audible frequencies;
5 a proxy configured to access an audio representation selected by the
6 listener, the audio representation being in a digital format;
7 a transformation module coupled to the memory and the proxy,
8 configured to transform the audio representation into a frequency
9 representation;
10 a scaling module coupled to the transformation module, configured to
11 scale the frequency representation based on the audio profile creating a scaled
12 representation, whereby the transformation module is further configured to
13 transform the scaled representation into the digital format;
14 a transmitter for initiating delivery of the digital format scaled
15 representation to a listener computing device via the network.

1 21. The server of claim 20, wherein the transformation module and the scaling
2 module operate upon the representations in a batch process, whereby the scaled
3 representation is of higher quality than is producible in a real-time process.

1

1

1 22. A machine-readable medium having embodied thereon a program, the
2 program being executable by a machine to perform method steps for providing
3 audio adapted according to a listener's auditory capability, the method steps
4 comprising:
5 accessing a personal audio profile of the listener, the audio profile
6 describing the auditory capability of the listener in relation to a plurality of
7 audible frequencies;
8 accessing a digital representation of audible sound selected by the listener;
9 and
10 creating an adapted representation of audible sound by modifying the
11 digital representation based on the audio profile to assist the listener in
12 perceiving the audible sound.

1